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DYNAMICS OF INTERPERSONAL INTERACTION, A STUDY OF CONSULTATION AMONG GRADUATE STUDENTS IN A BEGINNING STATISTICS COURSE.

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SELF-REPORTS OF INTERACTION AMONG 100 GRADUATE STUDENTS IN TWO SECTIONS OF A FIVE-WEEK SUMMER SESSION COURSE IN ELEMENTARY STATISTICS WERE ANALYZED IN AN ATTEMPT TO INCREASE UNDERSTANDING OF SOCIAL ASSOCIATION AMONG HIGHLY SPECIALIZED PERSONS. SUMMARIES WERE COMPILED FOR 1203 INSTANCES OF INTERACTION--408 OF MUTUAL STUDY-HELP, 388 OF HELP GIVEN TO OTHERS, AND 407 OF HELP RECEIVED FROM OTHERS. MAJOR VARIABLES STUDIED INCLUDED FREQUENCY AND EXTENT OF INTERACTION, SALIENCY AND DIFFICULTY OF LEARNING, ANXIETY, AND SELF-ESTIMATE OF COMPETENCE. STATISTICAL ANALYSIS PROVIDED LIMITED SUPPORT TO THE STUDY'S PRIMARY THESIS, THAT INTERACTION AMONG HIGHLY SPECIALIZED PEERS MAY BE EXPLAINED BY SOCIAL EXCHANGE THEORY, WITH THE EXTENT OF INTERACTION DEPENDENT UPON PERCEIVED COSTS AND REWARDS. THIS PAPER WAS PRESENTED AT THE ANNUAL MEETING OF THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION (NEW YORK, FEBRUARY 17, 1967). (JK)

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DYNAMICS OF INTERPERSONAL INTERACTION
A Study of Consultation Among Graduate Students in a Beginning Statistics Course

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We take as given that there is pattern in the association among men. Processes which contribute to formation and to change of associations seem at times apparent; but again, why some association should be is obscure. Understanding of processes which promote and inhibit certain social relations may be facilitated by attempting to become more aware of what forms do exist. Describing the structure of social associations in diverse settings makes possible comparison, facilitating recognition of commonalities despite varied manifestation. Perception of a generalized form of social association in apparently dissimilar settings, then, enables focused search for underlying processes. As important,to find associational forms common in certain settings absent in another may elicit search for new explanation, rather than new ways to confirm the expected.

Highly specialized persons populate more and more forms of organization, including school. Given high person-specialization collectivities, social collaboration is critical. To bring to bear a highly differentiated competency assumes complementary specialization. The greater the number of branching alternatives of complementary specializations, the more difficult to attain coordination by means of programming work-flow. Further, given many complex branching alternatives, uncertainty about probable consequences of available alternatives may be anticipated. Willingness to assume the increased risk probably requires a large measure of social support, including protection against ill-informed censure.

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The motivation of highly specialized persons may be elicited by the prospect of attaining satisfaction of a different set of needs than elicits motivation among lowly specialized persons.[1] Much of the behavior of skilled and semi-skilled workers in an industrial plant, for example, may be explained in terms of seeking social approval among co-workers.[2] However, the behavior of physicians in a clinic does not readily fit that explanation.[3] Further, the forms of social association which prevail among the industrial workers and among the physicians appear dissimilar.

Importance of Fundamental Assumptions in Explanatory Systems.

Much of what is known about the association among men, particularly in work organizations, is based upon observation of lowly-specialized persons. Much of man's behavior is explained in terms of choice among a few, relatively immediate and highly visible alternatives taken as matters of certainty. Social approval elicited in face-to-face interaction meets such criteria. Few company incentive programs are comparable in terms of immediacy, visibility and certainty; correspondingly, they tend not to be as powerful in accounting for worker behavior. Similarly, approved ethnic background may overcome work-flow arrangements imposed upon social relations in production collectivities, in terms of explaining formation of cliques and the extent of group cohersion.

An elaborate superstructure must be erected upon an explanatory system rested upon assumption that man acts primarily to maximize rather immediate social approval, to accommodate the behavior of highly specialized persons. Description is necessary of mechanisms by which social approval is indirectly conveyed. Uncertainty absorption warrants special treatment. Displacement of immediate responsiveness to approval and disapproval in face-to-face encounter by gradual adjustment to consensual judgement of a diffuse society requires explanation. To effect the adaptation would be to explain processes by which expansive "generalized other" conception is possible, and what form social association take as the scope of persons' "generalized other" expands.[4]

Preliminary to reconstruction of an explanatory system, activity may be invested profitably in probing to ascertain more precisely points at which the theory is vulnerable.[5] A reasonable tactic is to observe whether predictable behavior occurs, particularly under conditions suspected to be adverse. Social exchange theory is susceptible to such test; further, recent work indicates that it is amenable to the adaptive strategy adumbrated above.[6]

An Overview of Social Exchange Theory.

Social exchange theory specifies that persons behave as they do in anticipation of reciprocity by others punished or rewarded by the activity. Activities which elicit higher rates of return on investment of time and autonomy are continued, often expanded; those which yield lower rates, and especially rates below what is perceived as some standard or average rate of return among one's associates, are evaded, and if not, generate anger. Initially exchanges among persons entail extrinsic utilities; although subsequently some of these may become fused with the person such that future exchanges are based upon intrinsic rewards.

From lack of equivalency in values exchanged, power emerges. The one who elects, of choice or necessity, to accept a value for which he cannot return the equivalent, must assume a stance of willingness to comply with future directives of the benefactor. Failure to do so precludes continued receipt of benefits.

Social exchange involves risk. Terms of exchange are not specified in advanced. The time and form of reciprocation is left to the discretion of he who is obligated. His reciprocation imposes a secondary value upon the transaction; by confirming the judgement, but more aptly the trust, of the person who assumes risk, the orderliness of the environment is demonstrated. To accurately predict the consequences of acts increase one's sense of potency, and is experienced as

rewarding. Promotion of such rewarding behavior has an effect of producing social cohesion. Even transactions which differentiate, yielding power, simultaneously may generate social integration.

Competition precedes cooperation. Initially, recurrent social exchange transactions are characterized by attempts to impress the other with one's superior qualities, in implicit bargaining for advantage. When it is perceived that a bargain has been struck, however, those party to the implicit agreement proceed to give extra measure in subsequent transactions. Persons subordinated act as if they seek to demonstrate that they are no threat to superordinates, so as to escape potential harm. Those granted power act as if they seek to demonstrate that they will exercise it to the advantage of its grantors, so as not to jeopardize advantageous transactions. Peers act as if to demonstrate their unity, so as to suggest, and if necessary to form a coalition against oppressive exercise of power, or conversely, threat to established power. As each prospers by the transactions, and particularly so long as a better alternative is not accessible to any participant, all attempt to ensure continuance of the pattern. Thus their behavior becomes characterized by cooperativeness.

What is designed for one or a few functions frequently has additional consequences. Men are simultaneously implicated in multiple transactions. Acts expressed to secure solidarity among co-workers, for instance, may contribute to increased deference demands by superordinates. To invest more time in interaction with a colleague, one foregoes opportunity to invest that time in another activity. Attempting to increase the return on an investment frequently jeopardizes another, leading to shifting of activity. The structure of social association, thus, continually changes; even the direction and intensity of the dynamic vacillates.

Such explanation is sufficiently consistent and comprehensive to warrant serious consideration. The comparative utility of the explanatory system is

partially dependent upon how susceptible it is to derivation of specific questions, and accessibility of factors implicated by the questions. A further determinant of value of the theory is the extend to which questions it suggests, and subsequent observations, are significant.

Social Association Within the Classroom.

Seeking to explore the utility of social exchange theory, then, focus is directed to social association among the collectivity of a classroom. Is interaction systematically distributed among students as one might expect from social exchange theory? Does differentiation occur in the direction and rate of interaction according to capability to reward others?

Values students may supply include instrumental advice relevant to concepts and skills of the course, and expressive support, or social approval. To supply utilities may or may not entail cost. For instance, to explain the computation of a product moment correlation may help the consultant attain greater facility in performing the computation and understanding underlying assumptions, even as it benefits the person being advised. However, to repeat the same explanation to successive persons probably incurs diminishing returns, shortly ceasing to be its own reward. Similarly, to express approval of another person's act of offering help to less knowledgeable peers, does not imply a deferential stance. It may enhance the approver's situation, lessening demands for unprofitable consultation by making available alternative consultants.

Perception by the receiver that a benefit is supplied without cost to the supplier, however, is not adequate to relieve his obligation. Rather, the extent of dependance upon services commanded by another determines obligation. Exploitation of opportunity to obligate another at little or not cost, however, risks incurring wrath. The risk is minimal, though, unless a number of persons discover through mutual interaction their common plight. In coalition, opposition becomes tenable. The several may forego the service, "investing" their deprivation to effect readjustment. Alternatively, they may "demand" that the

service be provided without reciprocity, applying negative expressive sanctions to secure compliance. What is important, in either case, is that saliency previously attached to one activity has been displaced, with approval in social interaction assuming predominating importance.

Prediction of social association among students necessitates accounting for complex interaction among variables. Whether pairing relationships among students with equivalent competency develop, rather than extensive constellation around more expert students, for example, may depend as much upon performance visibility as difficulty and perhaps saliency of the activity. Again, the form and intensity of integration-differentiation yielded by consultation among students is influenced by the perception of cost and value of giving and receiving advice and approval. Such perception varies according, at least, to amount of consultation, performance visibility, task complexity, and saliency. These will obviously differ among students within a class. Then the extent to which commonality is perceived mediates upon saliency, and indirectly, upon crystallization of group character. Serial predictions can only crudely approximate the dynamic interaction.

As a first approximation, however, a series of predictions may be warranted. The following predictions, thus, may contribute to description of social association within the boundaries of the temporary collectivity of a university course. While classroom groups are the preferred unit of analysis, in this instance the individual student is taken. Thereby logistical problems are minimized, while the reasonableness of the basic orientation and methodology is explored.

First, what might one speculate regarding the probable extent and distribution of interaction? The orientation of students to the task may be expected to influence the gross amount of interaction, thus:

> The greater the saliency of learning concepts and skills of the course, the more the interaction.
>
> The greater the difficulty anticipated in learning concepts and skills of the course, the more the interaction.

Interaction among saliency and anticipated difficulty may provide a more powerful predictor, thus:

> The greater the anticipated difficulty among those for whom learning the concepts and skills is highly salient, the more the interaction.

Perhaps an alternate way of approaching the same thing is to inquire regarding anxiety, thus:

> The greater the anxiety, the more the interaction.

Perception of relative competency probably influences the likelihood of initating interaction, and the gross amount of interaction, thus:

> The less extreme the self-estimate of competence, the higher the frequency of initiation of interaction.

The reasoning is, the lower the self-estimate of competence, the greater the risk of subordination should the low competence become commonly perceived through interaction. High assumed competence, on the other hand, reduces the need for expert help, and increases the preference to avoid risking the potential for subordination entailed in initiating interaction. Further, initiating interaction risks contributing to a reduction in the discrepancy between own high competence and that of others assumedly lower. (A long-time perspective might lead to reduction of the discrepancy so as to enhance one's own opportunity for increased learning. However, from a short-time perspective, to reduce the discrepancy might entail foregoing the opportunity to subordinate other persons in the course.) Given assumed moderate competence, the prospect of improving one's relative position through expert advice warrants the moderate risk entailed in revealing one's average ability.

In terms of gross interaction, the larger potential profit would rest with interaction among persons possessing dissimilar competence, hence:

> The more the interaction, the more the interaction with person of dissimilar competence.
>
> The more the interaction with persons of dissimilar competency, the better the performance.
>
> Hence, the better the performance, the more the interaction.

However, the return on investment in helping others may be expressive, or social approval, rather than improved performance, return in instrumental form. Thus for the latter two predictions, "the more the satisfaction" might be substituted for "the better the performance." Actually, a better fitting prediction might be obtained by incorporating such substitutability into the statement, at considerable increase in complexity of analysis.

The above relations, further, may be masked by limited performance visibility. However, interaction should contribute to performance visibility, hence:

> The more the interaction, the more accurate the perception of one's relative competence.

And from the two previous predictions:

> The better the performance, the more accurate the perception of one's relative competency.

From earlier predictions one might anticipate, for example:

> The more the increase in rate of interaction, the greater the gain in performance.

Such a prediction is undoubtedly an oversimplification. A substantial increase in interaction might rather be associated with seeking security in dependency when confronted with the threat of an examination, effectively usurping time for study.

The greater the investment, the greater the effort one might be expected to make to protest it, thus:

> The more the discrepancy between one's investment and current performance, the more the interaction.
>
> Furthermore, among persons perceiving a discrepancy between investment and performance, the more the interaction, the greater the dissatisfaction.

That is, perception of lack of an equitable return on an investment should lead to effort to rectify the matter. Should that take the form of seeking help, the opportunity exists to crystallize an opposition ideology, should improvement be lacking. Such an ideology might be reflected in dissatisfaction.

Rather obvious predictions might be made regarding performance and satisfaction states, given discrepancy between the amount of help given and help received. However, the difficulty of knowing the values assigned by giver and receiver, plus the substitutability of expressive and instrumental benefits, discourages such effort.

Greater confidence may be put in some predictions more methodological than substantive in character, such as:

> The greater the initial facility with concepts and skills of the course, the better the subsequent performance.
>
> The greater the prior investment, the less the anticipated difficulty.

Observation on the outcome of different ways of getting at factors, and further methodological matters will be considered following description of the context and procedure used in testing the predictions.

Context and Methodology

The particular context selected for observation entailed exceptionally adverse conditions under which to expect stabilization approximating a rational distribution of investments. Course activity did not necessitate collaborative activity. Opportunity to discern relative competency was limited. Other course and social activities comp eted for potential interaction time. Students were predominately commuteres, hence lack of proximity during uncommitted hours mediated against interaction. Scheduled meetings totaled only twenty-five 50-minute lecture-discussions during a five-week summer term. To find even weak relationships under such conditions would encourage further investigation. Unfortunately, to find no relationships would not justify assuming none would be evident given more favorable conditions.

Specificlly, the context was an introductory course in elementary statistics, designed for beginning graduate students in the field of education.[1] Offered in

[1] Cooperation of the students, and the assistance of the instructor, Florence Hennen, is gratefully acknowledged.

two sections, equivalent in size and by the same instructor, during a 1966 Summer Session at the University of Minnesota, Total enrolllment was 115, although student absences during data collection reduced the number of students observed to 100.

Three kinds of data were collected by the author, and a fourth by the course instructor. Initial facility with quantitative and statistical concepts and skills was tested during the initial session, after administration of an instrument developed to elicit additudal information (available upon request). Reports of interaction were collected weekly at the beginning of the class meeting on Friday, except on the Thursdays preceding midterm and final examinations.
The day prior to the final examination, an alternative form of the attitudal instrumental was administered. Performance measures were supplied from instructor administered examinations. Student response to the instruments was cooperative, although the accuracy of self-reported interaction is suspect. Despite instructor encouragement, describing peer interactions on the instrument did not appear to entail sufficient time for comprehensive and accurate reporting.

Analysis

The yield of reported interaction was scant. In total, 606 instances which might be termed consultation were reported.[7] Double counting, however, accounts for some of the of the total. The packet of "Interaction Inventories" completed weekly by the students included three forms. One page permitted students, by placing checks in appropriate columns adjacent to a listing of persons enrolled in the course to indicate both number and duration of consultations in which they sought help from another student. A separate page elicited reports of consultation in which amother student sought help from the person completing the form. The same interaction, thus, might be reported by two persons, in different ways. On a third page, mutual study-help interactions were reported. Giving another help, receiving help, and engaging in mutual study-help, thus, constituted consultation. The gross count of such interpersonal interactions numbered 606.

An expanded representation of those interactions was obtained with a simple weighting procedure. A fifty-minute consultation might be expected to have greater influence upon performance and attitude than would a five-minute consultation. Hence differential values were assigned for longer durations of consultation: "1" for up to 10 minutes, "2" for 11 to 60 minutes, and "3" for 61 or more minutes. Then simply summing for each student the tally and value of his reported consultation yielded what will be referred to as "sum of interaction." The sum of interaction corresponding to the gross count is 1203. (An alternative weighting was also explored, obtaining the product of the tally and assigned value. As would be expected, the correspondence was rather high; an r of .79 was obtained between the gross frequency of interaction and the "product of interaction.")

Eighteen persons reported no interaction in any form. Hence the totals cited above were contributed by 82 persons over a period of five weeks. The distribution of that interaction warrants further scrutiny. It may be readily broken down in three ways: (1) the identity of the two sections of the course was retained; (2) two reporting periods were established, summing interactions for the initial three weeks (midquarter examination providing the arbitrary breaking point) to constitute period one, and the final two weekly reports to constitute period two; and (3) separate summaries were compiled for mutual study-help, help given to others, and help received from others. Summaries are shown in Table 1. (see page 12)

It is interesting to speculate upon discrepancies between reports elicited by the forms PERSONS WHO HAVE SOUGHT HELP FROM YOU and PERSONS FROM WHOM YOU HAVE SOUGHT HELP. Every interaction might be reported twice, once by the person seeking help, and again by the person from whom the help was sought. Their perceptions might differ; each might perceive that the other came to him for help. Of course, in clear cut instances, such consultations would be expected to be reflected on the form MUTUAL STUDY-HELP INTERACTION. One might expect, then, minor discrepancies. However, some actual discrepancies were large. Inspection of Table 1

Table I. Summary of Interaction (Sum) by Section, Period, and Form.

	Mutual Study-Help			Help Sought by Others from Respondent			Help Sought by Respondent from Others			Total Consultation		
	First period	Second period	Both periods	First period	Second period	Both periods	First period	Second period	Both periods	First period	Secnnd period	Both periods
Section I n=48	63	121	184	92	27	119	69	99	168	224	247	471
Section II n=52	101	123	224	202	67	269	105	134	239	408	324	732
Combined Sections	164	244	408	294	94	388	174	233	407	632	571	1203

Table III. "Ratio Between Mutual Interaction and Total Interaction."

	First period	Second period	Both periods
Section I	.28	.50	.39
Section II	.25	.38	.31
Combined Section	.26	.43	.34

Table II. "Ratio Between Giving Help and Giving plus Receiving Help."

	First period	Second period	Both periods
Section I	.57	.21	.42
Section II	.66	.33	.53
Combined Section	.63	.29	.49

reveals several discrepancies in excess of two-to-two, including more than a three-to-one discrepancy occurring in Section I during the second period.

Table 2 presents an alternative representation of the phenomenon. Calculating a ratio between giving help and the sum of giving help and receiving help, .49 is obtained when both sections and period are collapsed. A perfect correspondence would be .50; giving help simply would amount to one-half of the total interaction, excluding mutual study-help. During the first period, greater awareness is evidenced of attempts by others to secure help. Later, however, perception of such attempts apparently became less acute, while awareness of one's own initiation of consultation requests sharpened.

Such a shift is reasonable. An explanation may be adduced, following the argument that differentiating efforts precede attempts to secure integration. Greater between-period change occurred in the reports of help sought by others, rather than in the reports of consultation initiated by the respondent. An initial competitive or defensive orientation is suggested by predominance during the first period of reports of initiatory action by others. Perceptions were directed toward social action of others, enabling assessment of relative competence.

The midterm examination marked the arbitrary termination of the first reporting period. Too, it marked a change in orientation, perhaps responsive to indication of lower performance than anticipated. (A negative correlation, although low, was obtained between anticipated performance and actual performance on the midterm examination.) Subsequent shifting of focus away from social action of others (more so than shifting toward one's own social action) suggests a cooperative or integrative orientation. Respondents, it may be speculated, became inclined not to assess relative competence of others, inhibiting an increase in differentiation. The accompanying increase in perception of own initiatory social action may be interpreted as evidence of approachability. Students apparantly became more receptive to cooperative interaction, as acknowledgement of need for help came more readily.

Further support may be obtained by comparison of the ratios of mutual study-help to total consultation between periods, illustrated in Table III. (see page 12) A ratio of .33 would indicate an even distribution among the forms of consultation. And in fact, again collapsing the sections and periods yielded .34. The argument, however, leads to an expectation of relatively little mutual study-help during the first period, and much during the second period--which is as found.

Alternative explanations may be devised. High initial anxiety, for example, might be advanced as inhibiting focus upon own behavior. However, measures of initial anxiety and subsequent anxiety were obtained, and no significant difference was apparent. The subsequent measure yielded a slightly higher mean, with less variability (initial mean 2.03, S.D. .74; subsequent mean 2.28, S.D. .68).

Another suggestive finding was interaction differences between sections. It was assumed that the sections would be equivalent; the only known factor than might contribute to difference was the hour at which the section met (Section I met 8:00 - 8:50 a.m., and Section II met 10:00 - 11:00 a.m.) Obvious biographical characteristics (age, sex, education level, prior instruction in mathematics and statistics) and attitudal measures (anxiety, importance to learn statistical concepts and skills, anticipated difficulty, anticipated performance, enthusiastic to resentful feeling) revealed no significant differences. Neither did subsequent performance measures (midquarter and final examinations) or attitudal measures comparable to those administered at the beginning of the course, secured just prior to termination of the course. Yet Section I accounts for less interaction, after correcting for differences in number of persons (48 in I, 52 in II). Only in mutual study-help sought by others were most deviant, becoming slightly more extreme during the second period. The differences are puzzling. One may speculate that the social systems of the two sections were dissimilar, with Sections I being relatively undeveloped. Increase in dydatic pair relationships (mutual study-help), and de-emphasis upon interactions entailing greater risk may reflect lack of the security

of a differentiated social structure. Pair relationships may increase in the relative absence of structural differentiation. Section I exhibited a higher proportion of mutual study-help to total interaction, including a greater increase in mutual study-help and greater decrease in both help sought by others and by self.

No support was obtained for many of the predictions about individual performance and attitude. For example, neither saliency or difficulty experienced in the course, when correlated with sum of interaction, yielded an r above .10. Nor did anxiety and interaction sum exhibit a meaningful association. The test of some predictions, too, proved impractical. Thus, to examine the prediction that, "The greater the anticipated difficulty among those for whom learning concepts and skills of the course is highly salient, the greater the interaction," entailed restricting analysis to a few cases. In that instance, 41 persons indicated high saliency. Only 13 of them anticipated much difficulty. The mean interaction sum for them was 8; for the remaining 31 persons, the mean was 5. Perhaps one might be encouraged to explore the notion further with a larger sample and refined measurement and analysis; however, he would not reasonably attach significance to the present instance.

Support was not obtained for the prediction that persons estimating their competence to be average would initiate more interaction. The mean initiation of interaction among students who made extreme estimates was 2.2 (n=38) contrasted with 5.1 (n=62) among students estimating medium competence. Applying a t test yielded .78, not significant at the .05 level.

Initiation of interaction was examined in relation to performance. Among students who received a "C" or below, the average amount of initiation of interaction (report by respondent of help he sought from another) was 6.56 (n=23). Among "B" students, the mean was 3.80 (n=36), and for "A" students, 2,73 (n-41). Applying a t test between "C" and "B" students yielded 1.29; 1.68 is needed for significance at the .05 level and 1.30 at the .10 level. Between "C" and "A" students,

the t was 1.69, significant at the .05 level. Similarly, a comparison between "C" and "A" plus "B" students in terms of initiation of interaction was significant at the .05 level (t=1.99).

The prediction that the more the interaction, the more the interaction with persons of dissimilar competence, elicited an r of .58. For this comparison, the "product of interaction" referred to earlier was used in conjunction with the frequency of interaction between persons of dissimilar competence. Support was not obtained for predictions which followed, however. That is, more interaction with persons of dissimilar competence was not found to be related to performance (r =-.10); neither was performance a good predictor of interaction (r =-.16). The latter result, of course, is consistent with the finding that "C" students sought more help.

More interaction did not contribute to greater accuracy in prediction of own performance. A chi square analysis, comparing "hits" and "misses" with interaction levels, yielded nothing of consequences (1.59; .05 significance would be 5.99, with 4.60 at .10). However, a similar analysis of accuracy and performance, although at 3.87 not quite significant at the .10 level (about .12), might encourage further testing of the prediction with a larger sample.

No association was found between increase in interaction and improvement in performance. No strict test of the prediction was actually performed; rather, a correlation between total interaction change (both way) and total performance change (both way) was calculated, to no avail (r=.10). Visual inspection of the 28 instances of increase in interaction did not encourage further tests. Similarly, a prediction of increase in interaction, the greater the discrepancy between investment (a composite of education level, prior instruction in mathematics and statistics, and saliency) and performance, was not substantiated. (Analysis was comparable to that described above.) Consequently, no analysis was attempted for the prediction that dissatisfaction would be associated directly with

interaction given a discrepancy between investment and performance.

The methodological prediction concerning initial facility with quantitative and statistical concepts and skills received some support. Association of pre-test scores with midterm plus final examination scores yielded as r of .47. That portion of the pretest having to do only with statistics predicted as well (r=.47); the mathematical portion was not as highly related (r=.35). Interestingly, the mathematical portion was more highly correlated (although still low) both with anticipated difficulty and difficulty experienced (.51 and .46, respectively) than the statistical portion (respectively, .34 and .34). Prior investment was generally comparable to the mathematical portion in terms of relationship with attitudal measures. For example, association between investment and anticipated difficulty yielded an r of .46.

Influence of the larger environment may be inferred from a somewhat frivolous exploration. A campus culture, for example, may account for a certain negative correlation (-.76) which in essence indicates a propensity to underestimate own competence, the higher one's actual competence; conversely, to overestimate, the lower the actual competence. With "1" reflecting an extremely low prediction of probable performance but extremely high actual performance, progressing to "5" reflecting a extremely high prediction accompanied by extremely low performance, a correlation was computed between that "prediction-performance ratio" and actual performance, yielding -.76.

Assuming "zest" is interpreted as relevant to work or instrumental activity, while "satisfaction" is taken to be relevant to social or expressive activity, responses elicited by items so labeled would not necessarily be highly related, although a low correlation would be anticipated. Thus the r of .43 obtained between zest and satisfaction measures is reasonable, and worth noting in an exploratory investigation.

The import of this analysis may be reckoned in terms of exploration of social exchange theory. The reasonableness of some of the explanation is attested; however, some of the explanation gains no support, yet may not be considered to be disproved. Paradoxically, this may be taken as encouragement. The explanatory system is susceptible to derivation of predictions. Some of the predictions appear to be relatively accessible to test. Certain appear reasonably accurate. Among such as those less accessible or less accurate, or both, may be potential for obtaining understanding of social association among highly specialized persons.

In the present investigation, those predictions for which support was not obtained tended to assume relationships more direct than indirect (e.g., "The better the performance--alternatively, the greater the satisfaction--the more the interaction.") Maximization of return, thus, was taken to entail improvement of performance or satisfaction state, or both, following immediately an increase in interaction. More probable, anticipated returns which elicit behavior are less direct and immediate.

Using the natural classroom collectivity as a context for exploring patterns of social association, and processes which influence such structure, is feasible. For persons inclined to cope with dynamics of social association, the choice warrants consideration.

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6. Peter M. Blan. Exchange and Power in Social Life. New York: John Wiley, 1964. See also George C. Homans. Social Behavior. New York: Harcourt, Brace and World, 1961.

7. Professor Douglas Anderson provided consultation regarding computer analysis. Computer time was granted by the Numerical Analysis Center of the University of Minnesota. Richard Williams assisted with initial ordering of the data. Jack Zimmer was instrumental in further ordering and computer analysis.